INTERNATIONAL
SYMPOSIUM ON

TOXICS IN THE NIAGARA:

A Shared Challenge

SUMMARY OF THE
PRESENTATIONS

Sponsored by:

Environment Canada

United States Environmental Protection Agency

Ontario Ministry of The Environment

New York State Department of Environmental Conservation

INTERNATIONAL SYMPOSIUM ON TOXICS IN THE NIAGARA:

A SHARED CHALLENGE

Summary of Presentations

Toronto, Ontario, Canada

February 3-6, 1987

Symposium Sponsored by:

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OVERVIEWS

INTERNATIONAL SYMPOSIUM ON TOXICS IN THE NIAGARA
Toronto, Ontario
Canada

February 3-6, 1987

ENVIRONMENT CANADA'S OVERVIEW

The Honourable Tom McMillan,
Minister of the Environment for Canada

Madam Chairperson, distinguished colleagues, ladies and gentlemen, friends:

Thomas Babington, the 19th Century British essayist better known as Lord Macauley, once said that a person who had never seen the Niagara didn't know what a river was. In recent years, Macauley's words might more accurately be: Anyone who has viewed the Niagara knows how inventively humans can trash their natural environment. Today, we Canadians and Americans -- Trustees of one of the world's most famous waterways -- take a major step to make the river, once again, the mighty Niagara.

Today, as well, for the first time ever, the heads of the four environmental agencies for Canada, the United States, Ontario and New York appear publicly together. How appropriate that the occasion should be the signing of an historic DECLARATION OF INTENT to restore the very waterway that, for millions of people around the world, symbolizes the environment that Canada and the U.S. share. For Canadians and Americans, however, the Niagara is more than a symbol. It is a major source of pollution in the entire Great Lakes-St. Lawrence River Basin, from which millions of residents derive their drinking water.

The signing constitutes both an end and a beginning -- an end because it is the culmination of four decades of detailed work towards a Niagara River Accord ... a beginning because our work does not stop today. In a sense, the Accord merely launches it, and the job itself will terminate only when the pollution terminates.

Madam Chairperson, allow me to strike a personal note. When I was appointed Canada's Minister of the Environment some 17 months ago, I identified a clean-up plan for the Niagara River not only as a priority of the Government of Canada, but also as a priority of mine. I reconfirmed that commitment two months after my appointment, at the Permanent Solutions Conference sponsored by Pollution Probe.

Clearly, my own sense of urgency was shared by Lee Thomas, head of the U.S. Environmental Protection Agency; by Hank Williams, Commissioner of the New York State Department of Environmental Conservation; and by Jim Bradley, Ontario's Minister of the Environment, not to mention many environmental groups and, increasingly, the public at large, on both sides of the border.

The first major step towards today's signing was taken with an all-party agreement on the Niagara River Toxics Management Plan, released on 30 October, 1986. The plan described specific work, and schedules for completing work, which the four Canadian and American jurisdictions agreed to do, both collectively and individually, to restore the Niagara.

The Declaration of Intent to be signed today commits the four jurisdictions to that work plan. The goal is to virtually eliminate persistent toxic discharges, pursuant to the 1978 Great Lakes Water Quality Agreement. As such, the Declaration is a statement of political will.

Specifically, the signatories agree to slash by 50% by 1996 loadings of persistent toxic chemicals from both point sources and non-point sources on the two sides of the river.

Of particular interest to us in Canada is this: Next year, and each year thereafter, the process requires the four jurisdictions to review and publicly report on the state of new and emerging technologies applicable to hazardous waste landfill site remediation. The emphasis is on such techniques as excavation, removal, and on-site destruction of contaminated materials. On all chemical dump sites, excavation, removal and destruction will be considered an option. I believe the major study currently being undertaken by Pollution Probe, with substantial Environment Canada funding, will give impetus to that option.

The 50% target reductions for point sources and for non-point sources alike will be based on water samples collected over the next year. For the first time, all jurisdictions will have an agreed-on, scientifically verifiable, baseline on which to calculate toxic loading reductions and on which each jurisdiction can hold the other to account for its reductions.

And yet the process is not a static one. On the contrary, the management strategy enables us to adopt whatever remedies are most effective at any particular site or discharge point, taking fully into account rapidly changing technologies. The dynamic nature of the approach, within specific goals, is its greatest strength and the best assurance we have that it will ultimately succeed.

Indeed, the international Symposium on Toxics in the Niagara, which we are kicking off this morning, should be seen as an instrument to help achieve the goals of the Declaration of Intent being signed today. I say that because it is through such combined explorations of technological possibilities that we will both restore the Niagara and preserve it for generations yet unborn.

I welcome all participants to the Symposium, especially our foreign delegates, and I thank each of you for contributing to this most worthwhile information exchange.

The Niagara is more than a river -- it is a lesson in what happens when neighbours dump garbage on one another's front lawn, even as they celebrate the fact they are neighbours. But, by the same token, today's agreement demonstrates that the governments of four large and complex jurisdictions can work together on a seemingly intractable environmental problem.

Let it be a model for intergovernmental action on other bilaterial pollution problems still to be eliminated -- among them, of course, acid rain.

The history of North America gave Canada and the United States different systems of government. Geography gave us different resources. Fate may give us different destinies. But, paradoxically, our common pursuit of economic goals has endangered the environment we share and the future of all our children. Today, we are challenged to work together to heal what we have harmed, to mend what we have damaged, to pass on to future generations what was, until recently, passed on to us: a clean and healthy environment. There can be no more noble cause.

Thank you.

U.S. ENVIRONMENTAL PROTECTION AGENCY OVERVIEW

Lee M. Thomas
Administrator

It is a real pleasure for me to be with you today and actually it is something that Tom McMillan and I discussed nearly a year ago. We talked then about how to deal with an extremely difficult issue between our countries -- the topic of Toxics in the Niagara.

Obviously, being here with the leaders of the environmental agencies of the four jurisdictions is a significant step in solving that problem. But it is only a step, a step in a long journey toward ensuring that the Niagara, once again, is restored as far as its quality, both for human health and the environment.

In the United States, we are committed to that goal. The Declaration of Intent, that the four of us will sign today, is evidence of that. We laid out, as you know, a management plan over the last several months which has been a forerunner of this Declaration of Intent. Today, what I would like to do is give you a brief overview of two of our most important statutory authorities which will ensure that we, in fact, carry out that Declaration of Intent so that the ultimate goal is met. Those statutory authorities are the ones which we use to manage the disposal of hazardous waste, and the clean-up from the mismanagement of hazardous waste in the past.

One is the RCRA authority -- that stands for Resource Conservation and Recovery Act; the other is the Superfund Authority. These are two of our most important statutes, and they will have major implications on how we are able to move forward on the U.S. side, both under the authority that I have at the federal level, and the authority that Hank Williams has at the State level.

Both of these authorities have, as their intent, the prevention of future problems. Under RCRA, we are preventing problems from improper disposal of hazardous waste now and in the future. Under Superfund, we are working to permanently clean up existing problems from the past mismanagement of hazardous waste. The proper disposal of hazardous waste is one of the priority concerns of the American public.

I recently saw the results of a poll from the Ropert organization, which for a number of years has asked questions about the environmental concerns of the American public. It reflected that fact that today 9 out of 10 Americans feel that the proper disposal of hazardous waste is the priority issue for us to address in the United States. That kind of concern has grown, and I think that is exactly why the statutory authorities we have are as strong as they are.

For instance, the Resource Conservation and Recovery Act, our hazardous waste management authority, provides the framework for managing hazardous waste from its generation to its ultimate disposal. When it was reauthorized in 1984, there were major changes incorporated in that act, as far as the direction we should take in the United States for the management of hazardous waste. We have been implementing those major changes for nearly two years, and they are having a tremendous impact.

First, it said that we would expand to cover all generators of hazardous waste; in the United States that meant we went from regulating the majority of waste, by volume, at about 15,000 generating facilities, to regulating all waste at over 150,000 generating facilities. That is 150,000 industries which generate hazardous wastes that come under the regulatory authority of RCRA.

Second, it reduces the number of land disposal facilities - from approximately 1500 to less than 500 - by significantly impacting those that could continue in operation before they were fully permitted under stringent criteria.

So, we increased the number of waste-generating facilities we regulate and decreased the number of facilities which could legally manage that waste. RCRA also clearly set out that land disposal would be the option of last resort for us in our management strategy. Waste reduction, waste minimization, and waste recycling, would be the options of first choice.

Ultimately, waste cannot be disposed of on the land, unless we show, through a regulatory process, that land disposal is protective of the environment and human health. This means that the waste would have to go through a treatment process. Clearly it sets up a technology-forcing process with time-certain dates, as to when technology would have to be available to treat that waste. It sets up extremely stringent criteria for the design of the facility that would receive the residuals at the conclusion of that treatment approach. So there is a dramatic change on the way in our country in the way waste is disposed.

First: the volume of waste itself is being reduced; second, we are seeing a substantial reduction in the number of facilities for treating and disposing of waste; and third, there have been significant increases in the technical requirements that those facilities have to meet. Ultimately, land disposal will be for residuals that we, through a regulatory process, will determine are not a threat to human health and the environment.

Clearly, RCRA is designed to prevent problems in the future, the kinds of problems that we are dealing with under our second authority, Superfund. Situations such as Love Canal, Times Beach, Valley of the Drums, Stringfellow and many other large hazardous waste disposal sites in the United States have brought to the forefront the problems we have had due to the mismanagement of hazardous waste in the past. The result was the enactment of our Superfund Authority in 1980, and reauthorization of that authority this past year. We now have extremely strong and broad authority to permanently clean up mismanagement problems of the past. The reauthorization proposal incorporated a taxing process to raise nearly $9 billion dollars over the next five years to deal with that clean up effort.

In addition to that $9 billion dollars, there are very broad and deep legal authorities to seek out, find, and recover our costs from contributing parties, those who created the sites. I expect another $4 to $5 billion dollars from private parties to be added to that $9 billion dollars during the next five years, to clean up hazardous waste sites in the United States.

The Act basically states that we are to find those sites, assess the problems that they are creating for the environment, and clean them up. We have identified approximately 25,000 possible sites in the United States that need to be cleaned up. We have already

assessed nearly 20,000. Of that number, we have identified approximately 1,000 sites which require long-term clean up under our authority. The majority of these cleanup operations are now underway. A number of those sites, as you know, are along the Niagara Frontier.

It is not easy to assess the sites; it is not easy to come up with a solution. It takes years to deal with the complex technical, legal, and public process issues associated with determining the extent of the problem, deciding on a solution, reviewing the solution with the public, and concluding and implementing the remedy. But, in fact, we are finding that we are able to work through that process and move forward to clean-up.

As we look at the authority that Congress gave us in the reauthorization of our new law, we see that they set a clear direction. First, they said we should focus on permanent solutions. Where we cannot find a permanent solution, we should continue - after we have contained a site - to review it on a periodic basis until a permanent solution can be found. We are to give preference to treatment of the waste that we find at the site in the context of seeking a permanent solution. In order to ensure that we are forcing technology and aiding in the development of new technology, there was a significant expansion for our research and development authorities; in fact, we are now working with industry and the public to aid in the development of new technology for treatment and destruction of hazardous waste.

This significantly strengthens our enforcement authorities, which are already very broad indeed. But it makes that authority even stronger to ensure that we find the responsible parties, and have them pay for or reimburse us after we pay for the clean-up of the site. The law significantly expanded the involvement of States in the process of managing the clean-up, making it consistent with our hazardous waste regulatory program, which is largely managed by the States. It significantly increased our authority and focused on public health concerns at every one of those sites. It emphasized the involvement of citizens; and it specifically gave us the authority to provide funding for citizens to more actively participate in site remedy review, and have input into the selection of the remedy.

It authorizes citizen suits, if we do not carry out our responsibilities. It also authorizes a number of new activities related to community preparedness, corrective action for underground storage tanks, and many other things. For its primary purpose, the clean-up of the old hazardous waste sites in our country, it significantly strengthens our authority, provides significantly more funding, and tells us to move forward with the momentum that was established in the first five years.

Not only do we want to prevent the problems of the future, but we want to take care of the problems of the past. Those two authorities will have significant implications for the Niagara Frontier, as well as for the rest of our country. We are committed to working with our counterparts in Canada in ensuring that the Niagara River, and the Great Lakes as a whole, are restored and maintained as a great world natural resource.

One of the more positive experiences I have had over the last two years as Administrator is working with my counterparts in Canada. In coming to the point that we are signing this Declaration of Intent, none of the four agencies has ever differed during that two year period - on where we wanted to go. We have worked through, and have come to

agreement on many issues: these include our objective; our commitment to deal with the river; and our commitment to deal with the Great Lakes. We will also cooperate, to speak from the same data, to establish benchmarks to measure our success; as well as to establish how we will go before the public to talk about the issues and receive input as to whether we are moving in the right direction, or should modify that direction.

Under this agreement, we can achieve our objective, and over time we can review how well we are doing together. So it is a pleasure for me to be with you today and to work with you as we review how we are doing, but more importantly, where we are going.

Thank you.

ONTARIO MINISTRY OF THE ENVIRONMENT OVERVIEW
The Honourable Jim Bradley,
Minister of the Environment for Ontario.

Good morning.

As we meet here today we have reason for optimism about the Niagara River. Within the hour, Canada, the United States, New York State and Ontario will sign an agreement to clean up the sources of contamination to the river.

We have made progress on this issue. I commend Tom McMillan, Lee Thomas and Hank Williams for their good-faith negotiations and commitment to a cleanup of the Niagara.

At the same time, I realize that the job at hand is far from over. Our agreement outlines good cleanup and monitoring progrms. Our new task is to implement those programs energetically. On both sides of the border, we must ensure that our commitment to revitalize the Niagara River is more than words -- it must show results.

All parties have an enormous stake in the speediest - and most thorough -cleanup of toxic sources entering the river. For the people of Ontario, certainly, restoring and protecting water quality is imperative - to maintain our environment and to safeguard our economic, social and physical well-being.

For one thing, the greatest concentrations of Ontario's population - and Canada's - are in Toronto and in communities along the shores of Lake Ontario, into which the Niagara River flows. Many of our recreational and aesthetic needs are satisfied by this body of water. It provides a vital source of drinking water for many Ontario households.

Drinking water alone is reason enough to demand that we clean up this river, but there is more. Restoring the river also protects the long-term interests of the many industries and services that have developed along both the Canadian and U.S. shorelines. As expensive and difficult as abatement and cleanup programs may be in the short-term to individual industries, these measures ultimately lead to a more secure environment for sustained economic development.

Those too short-sighted to understand the economic impact of a polluted environment would do well to look at what is now happening in Florida. The automaker BMW is refusing to ship its cars into the port of Jacksonville because heavy acid rain there is eating away the automobile paint. Recent news reports state that other automakers are considering similar action, putting the port's $100 million a year vehicle handling business at risk.

Clearly, there is an economic cost to environmental degradation. What is more, the cost of abatement and restoration tends to escalate as the problem is allowed to continue.

Cleanup today does have a price tag, but it is a bargain compared to the cost we - or our grandchildren - will incur later. That is, of course, IF future cleanup is possible at all. In

light of the kinds of persistent toxic contaminants we now know are getting into the Niagara River, indefinite delay could permanently impair the river and Lake Ontario, hobbling forever the economic potential of the people who live on the shore.

That alarming prospect is at least an excellent motivational tool -- one that we have taken to heart today.

After assuming my job in 1985, I ordered those responsible to take corrective action based on the recommendations of the Niagara River Toxics Committee Report. I am happy to report that strides have been made in the cleanup of Canadian pollution sources.

Atlas Steel, the main contributor of heavy metals on the Canadian side, has reduced its pollution by 35 per cent since the NRTC made its report. These reductions between 1981 and 1986 can be bettered.

Our Niagara River Improvement Team will be making suggestions on maintenance and operating procedures which should enable Atlas Steel to achieve, on a permanent basis, the 85 per cent pollution reduction it obtained in 1985.

Another Canadian pollution source is the Niagara Falls, Ontario, sewage treatment plant, which was upgraded and expanded in the fall of 1985. It has taken longer than expected to get this plant up and running at full speed. The innovative operational design using rotating biological contactors required some extra implementation time to get the bugs out -- or rather, to keep the right bugs in. The plant will be inspected very soon to assess its performance. We will require that it meets its commitments at the earliest possible date.

We have, then, the beginnings of a positive pollution abatement story to tell in Ontario. Based on he NRTC figures, we have reduced Canadian source toxic loadings to the Niagara River by one-third from 1981 to 1986. Now we will do better.

I recently introduced a program that will achieve widespread toxic loading reductions to Ontario waterways. The Municipal-Industrial Strategy for Abatement, or MISA for short, is the tool we will use to protect and restore the Niagara River, Lake Ontario and all other Ontario waters.

Under this program, we will systematically reduce contaminant loading at source. For the first time in Ontario, we are placing limits on the absolute amount of pollution discharged into our lakes and rivers. Loading reductions will be required from virtually every major toxic polluter in the province. By including both municipal and industrial sources, we will cut contamination by both direct dischargers and by those companies that discharge into our sewer systems.

MISA is being implemented over a three-year period and hinges on two new sets of regulations. The first regulation sets stringent monitoring requirements, and the second establishes specific effluent limits for all affected industries and municipal sources.

The main thrust of MISA is to ensure that each contaminant discharger uses the best available abatement technology that is economically achievable, or obtains equivalent cleanup results by making process changes. Harm to the waterway need not be immediately apparent. If available abatement technology can reduce loadings, the

reductions must be made. In those cases where loadings are so great that water quality suffers even with the use of best available technology, we will require that ways be sought to gain further reductions.

MISA will have a direct impact in reducing Niagara River loadings from Canadian point sources. We will be able to cut down further our portion of the river's contaminant loadings. As well, we will greatly reduce our direct contamination to Lake Ontario itself.

In the case of the Niagara River, however, the most difficult and serious problems remain on the U.S. side of the border. Without doubt, it is there that the greatest amount of work needs to be done.

The four-party Declaration of Intent we have agreed to on the Niagara River Toxics Management Plan has taken us past the first hurdle on our way to a cleaner Niagara River. This accord is the product of lengthy negotiations. Some tough words were spoken, but the result is worth it.

This agreement is a framework for a cleanup, but by its very nature it does not spell out specific solutions to individual trouble spots.

I remain convinced that containment of the U.S. chemical dumps leaking into the Niagara River is only a short-term palliative. Ultimately, we will all agree that those dumps immediately adjacent to the river will have to be excavated and the toxic chemicals destroyed. Anything less means we risk disastrous toxic surprises down the road. It puts all of our costly and hard-earned Niagara River cleanup achievements at risk -- not to mention the health and welfare of untold numbers of U.S. and Canadian residents.

My ministry has been examining dioxin and other toxic contamination entering the Niagara River from the Occidental-Durez plant via the Pettit Flume. Both the sewer and its mouth in an embayment on the river require prompt and effective cleanup. The plant site itself may well require excavation of the toxic chemical wastes which are the source of the river pollution.

I recognize the excavation, and destruction, of the waste materials in these sites is an expensive proposition. As I said earlier, however, it is not as expensive as it will be down the road when a crisis forces your hand.

I urge my counterparts in other governments to look toward those who created the mess when they are seeking cleanup funds. These companies have huge environmental debts on the Niagara Frontier, and I would not like to see inadequate legal agreements limit their liabilities while leaving the problems unsolved.

Another source of money is Governor Mario Cuomo's bond issue, recently approved in New York, for the cleanup of chemical waste sites. I applaud the citizens of New York State who voted funds to address this problem, and I look forward to seeing some of the money applied on the shores of the Niagara River. I hope, as well, to see increased federaldollars make their way into Upstate New York. Funding from such sources is the engine we now need to drive our Niagara River objectives ahead.

As for Ontario, we have a modest provincial contingency fund we can draw upon to clean up waste sites we find to be polluting the Niagara River.

We have, now, a sound and dynamic four-party agreement for the restoration and preservation of a shared Ontario/New York State waterway. I believe that speedy action on this agreement is crucial. If we do it right, I expect to see a Lake Ontario in which drinking water quality is secure and where fish can be caught and eaten without worry or concern.

The toxic torture we are inflicting on the Niagara River and Lake Ontario must be stopped. Today the four concerned governments are pledging themselves to that task.

Thank you.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION OVERVIEW

Henry G. Williams
Commissioner

For New Yorkers, as for all North Americans, the Niagara region has given us two potent images, one positive and one negative. Since the first reports of that awesome cataract reached the eastern settlements, Niagara Falls has meant power and abundance, appropriate symbols for a growing continent. By contrast, Love Canal has become a synonym for irresponsible acts, and for damage to our water, our land, and our people. Unfortunately, the image of Love Canal predominates today. We intend to change that.

We are here today to endorse the four-party Declaration of Intent to implement the Niagara River Toxics Management Plan. By signing this document, we publicly pledge our faith, people, and resources, and we confirm our continuing commitment to the intent of the Declaration. We take this responsibility very seriously and we sign confidently, in the spirit of international cooperation and our strong mutual desire to clean up the environment we share.

In signing the Declaration, we are beginning a new venture, with all its accompanying challenges and possibilities. In New York, the work is already well under way. During the last decade, we have taken many initiatives to regulate toxic materials. We have enacted laws and implemented procedures to control point source discharges and we already have the most rigorous and comprehensive water resource management program in the United States. You will learn more about it from my staff during this conference.

Being tough on pollution control does not always win popularity contests, but we have a long-term goal in view. Let us never lose sight of it: people must be able to live and work in the Great Lakes Basin and to enjoy fully the air we breath and the water we drink.

To that end, we are working closely with industries and municipalities to ensure compliance with our standards, and we have demonstrated that we will take legal action, if necessary, to improve the quality of our natural resources. We will continue to make a sincere effort to involve the public as we plan, review, and implement our programs.

We are also working to develop a policy for reducing hazardous wastes where they are generated. When it is in final form, this Source Reduction Policy will apply to all toxic substances which are discharged, disposed or emitted into the environment. This policy will set forth a hierarchy of options to reduce the quantity and toxicity of wastes. As the policy is shaping up, the options are: source reduction, recycling, treatment, and disposal.

Our Source Reduction Policy will be the cornerstone of our Hazardous Waste Management Policy. The draft policy will be widely circulated for public review. We have been working with groups such as Greenpeace, and we are seeking comments from other interested parties.

Another way that we are reducing environmental damage is through our new State Solid Waste Management Plan, which applies to the Niagara Region as it does across New York

State. This plan, combined with our existing water quality controls, are positive steps towards our mutual, long-range goal of virtually eliminating all harmful discharges to the environment.

New York has already demonstrated its commitment. Since 1965, New York has invested billions of dollars in water pollution control programs, primarily paid for by people who caused problems. We are proud of the depth of our commitment, as shown by Governor Cuomo, the State Legislature, and our Citizens, who recently approved an Environmental Quality Bond Act that will provide $1.2 billion dollars to clean up toxic and hazardous waste sites. Much of this work will be done at sites in the Great Lakes Basin.

In addition, Governor Cuomo's budget for 1987-88 includes $1 million to establish a Center for Research on Hazardous Waste Problems, that will be located in western New York, and more than $700,000 is in the State budget to expand monitoring, sampling, and remediation in the Niagara River.

Our focus at this conference is upon the Niagara River. But we must also consider Lake Ontario the major resource which we share. We must focus greater attention on Lake Ontario -- its magnificent fishing and its vast supply of fresh water. The Niagara River is only one source of the toxic contaminants that end up in Lake Ontario. Because it has been studied so intensively, we probably know more about the Niagara River. It is a major contributor, but not the only one. We need to look upstream to the cities and industries in the upper lakes, and to other sources - to Syracuse, Rochester, and Watertown, as well as to St. Catherines, Hamilton, and Toronto.

The next major step is to develop a toxics management plan for Lake Ontario by the end of this year, as called for in the U.S.-Canada Niagara River Toxics Management Plan. This plan must provide a means for determining all the sources of toxic chemicals to the Lake.

It is becoming increasingly apparent that contaminants are raining and draining on the entire Basin - all the Great Lakes and their tributaries. We must reduce toxic loadings from non-point sources. We need to control urban runoff from nearby cities, as well as from Cleveland, Windsor and Chicago; we must control fertilizers and pesticides draining down from the vineyards, fields and orchards of New York's shore and from Ontario's; and we must limit the atmospheric deposition from many distant places which adversely affects us.

To all of these water and airborne substances we must add seepage from our landfills, toxic compounds from inactive hazardous waste sites, and pollutants trapped in sediments. All of these together make non-point source pollution an extremely complex problem.

It is imperative that we work together to solve these problems. For too long, we have strained the patience of Mayor O'Laughlin of Niagara Falls and other elected officials, and we have, in a sense, fostered the erosion of the health of our people and deprived them of the peace they are entitled to enjoy in our natural world.

Together, we need to seize the opportunity to remedy the effects of past, careless actions; we are explorers in a new land, as ready for new discoveries as the early voyageurs were before us. We need to develop new ways to solve these emerging

environmental problems, with unrelenting determination and uncompromising vision. We begin by giving meaning to these fancy words by our next-step actions: Source reduction, excavation and treatment, and enforcement.

We intend to restore the beauty of Niagara Falls, with all its force and majesty, as the only symbol that people think of when they hear the word "Niagara". That great rush of water can, indeed, be the emblem of a restored resource for all our people.

Thank you very much.

DECLARATION OF INTENT

BY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ENVIRONMENT CANADA

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ONTARIO MINISTRY OF THE ENVIRONMENT

RELATING TO

THE NIAGARA RIVER TOXICS MANAGEMENT PLAN

INTRODUCTION

The problems of toxic chemical pollution in the Niagara River have been well documented. Major investigations have identified existing and potential sources of toxic pollution along the River, as has work undertaken by the Parties to this Declaration, the International Joint Commission and, more recently, through the Niagara River Toxics Committee (NRTC) report of October 1984.

Numerous studies and investigations undertaken over the years have contributed significantly to the understanding of the complex problems in the river. They have also led to the implementation by the jurisdictions of a wide range of control programs and other measures to reduce the burden of toxic chemicals in the River.

The United States Environmental Protection Agency (EPA), Environment Canada (DOE), the New York State Department of Environmental Conservation (NYSDEC) and the Ontario Ministry of the Environment (MOE) - herein referred to as the Parties - have each identified their respective various programs and activities underway or planned on the Niagara in their responses to the recommendations of the Niagara River Toxics Committee. The Parties continue to undertake activities leading to the reductions of toxic chemical pollutants in both countries in accordance with existing laws and regulations which continue to evolve and which may not be similar in approach.

Under Article II of the Great Lakes Water Quality Agreement of 1978, the governments of Canada and the United States agreed to make a maximum effort to develop programs, practices and technology necessary to eliminate or reduce, to the maximum extent practicable, the discharge of pollutants into the Great Lakes System. This Article also states the policy of the Parties that the discharge of toxic substances in toxic amounts be prohibited and that the discharge of any or all persistent toxic substances be virtually eliminated.

While there are other sources of contamination, the Niagara River is a major contributor of toxic chemical pollutants to Lake Ontario. Public concern over toxics problems in the international waters of the Niagara River and Lake Ontario calls for the unified and collective efforts and will of the four Parties to protect and improve the quality of this valuable resource. Complementary actions carried out in both countries to address these problems include:

- Remedial Action Plans for Areas of Concern identified by the International Joint Commission (IJC);

- United States and Canadian Great Lakes Five Year Strategies;

- Canada-Ontario Agreement on Great Lakes Water Quality;

- Ongoing environmental programs in each jurisdiction.

PURPOSE

The purpose of this Declaration is to ensure that a management strategy is adopted which enables the Parties to move in a directed and coordinated manner toward the objective of achieving significant reductions of toxic chemical pollutants in the Niagara River in accordance with timetables and specific activities. The Parties commit themselves to using the authority provided by their domestic laws and regulations to this end. This is consistent with the goal of virtual elimination of toxic discharges, as agreed upon in 1978 by the Governments of the United States and Canada under the Great Lakes Water Quality Agreement.

In October 1986, the Parties released the first edition of a four-party Work Plan which establishes timetables and a set of specific activities to be undertaken. This Declaration in conjunction with that document, together form The U.S. - Canada Niagara River Toxics Management Plan, hereinafter referred to as the The Plan. (See Appendix 1).

THE PARTIES DECLARE THEIR INTENT TO:

Adopt and implement The Plan as a dynamic and evolving framework within which the United States and Canadian agencies will cooperatively take appropriate steps leading to a significant reduction in toxic chemical pollutants from point and non-point sources to the Niagara River, in a manner consistent with federal, state and provincial laws.

In so doing, and in order to achieve the goals of The Plan as stated in this Declaration of Intent, the Parties will:

1. Jointly establish a common basis for identifying, assessing and quantifying toxic chemical loadings into the Niagara River;

   Individually identify and establish priorities for control measures to reduce loadings;

   Individually implement chemical pollutant control activities in the Niagara River;

   Individually and jointly monitor and evaluate the success of control activities.

2. Take into account applicable water quality and drinking water standards and set as a target a reduction level of 50% for

persistent toxic chemicals of concern* from point sources in Ontario and New York by the year 1996. This achievement will depend on the progressive evolution of technologies, permits, standards, laws, and regulations in both countries.

3. Report by July 1987 and each year thereafter on progress made in identifying and quantifying loadings of toxic chemical pollutants originating from non-point sources in Ontario and New York. To this end, the Parties will work towards achieving a reduction of at least 50% of persistent toxic chemicals of concern* by the year 1996 taking into account siting issues, technology available, laws and regulations.

4. Establish an improved system of monitoring to ensure the effectiveness of all monitoring programs and schedules.

5. Enforce laws and regulations to ensure the maximum reductions in loadings. In general, point source control measures will be based upon the application of existing best available technology and the results of scientific evidence of environmental degradation. The Plan will be updated to reflect developments in these areas.

6. Use The Plan as a means of alerting the jurisdictions to those chemicals for which reductions are not occurring, so that appropriate corrective actions can be taken.

7. Review and update The Plan on an annual basis. As part of the review a progress report will be published and public input sought. The report will include an implementation schedule proposed for the coming year, the results of monitoring, a list of actions undertaken with respect to point and non-point sources, updated information on chemicals of concern, and scientific evaluations of new and developing technologies relevant to the program.

8. In 1988 and annually thereafter, review and report in depth (based to the maximum extent possible on existing Parties' reporting requirements) on the state of new and emerging technologies applicable to hazardous waste landfill site remediation with particular emphasis on such techniques as the excavation, removal, and on-site destruction of contaminated material.

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* A mutually agreed upon list of persistent toxic chemicals of concern will be developed from:

i) NRTC Group I and II lists of chemicals of concern;

ii) IJC Water Quality Board's 1985 list of "Critical Pollutants";

iii) Results of point and non-point source monitoring activities underway.

9. Submit The Plan and progress reports to the International Joint Commission as part of the Commission's Remedial Action Plan program for the Great Lakes.

10. Adopt the following goals for each component of The Plan:

a) River Monitoring

- determine the toxic chemical loadings to the Niagara River from Lake Erie (input);

- determine toxic chemical loadings from the Niagara River to Lake Ontario (output);

- determine toxic chemical loadings from sources along the Niagara River by comparing the difference between the output from the river and input from the river from upstream sources (input-output differential river monitoring identified by the NRTC);

Attempts will be made to determine the loadings with sufficient confidence to measure the effectiveness of the control programs.

b) Point Sources

- determine toxic chemical loadings from industrial and municipal facilities;

- estimate allowable toxic chemical loadings from industrial and municipal sources as provided in regulatory specifications;

- estimate reduction of toxic chemical loadings as a result of implemented control measures and scheduled reductions based on planned control measures;

- implement remedial and control programs so as to achieve the maximum possible reduction of toxic chemical loadings to the Niagara River;

c) Non-Point Sources

- estimate toxic chemcial loadings from tributaries and leaking hazardous waste disposal sites;

- estimate reductions in toxic chemical loadings as a result of implemented control measures, and scheduled reductions based on planned control measures;

- implement remedial and control programs so as to achieve the maximum possible reduction of toxic chemical loadings to the Niagara River. In addition, on all sites, excavation, removal and destruction of contaminated material will be considered as a means of eliminating contaminants to the river.

d) Chemicals of Concern

- identify and maintain a list of chemicals of concern (as determined by the NRTC, with further monitoring, research and priorities established by the IJC Water Quality Board) within the Niagara River ecosystem and promote the establishment of uniform environmental and human health criteria for those chemicals.

e) Technical and Scientific Cooperation

- carry out research, technical and scientific programs to assist the four jurisdictions in addressing the problems of the Niagara Frontier.

f) Communication Plan

- present information and scientific reports to the public, and seek their input to The Plan.

g) Organization and Implementation

- establish and maintain a management structure to ensure that the implementation of The Plan is effectively monitored.

h) Reporting

- update The Plan annually and issue status reports at the beginning of each calendar year.

11. Initiate activity on a Lake Ontario Toxic Management Plan which will be similar in content and scope to the Niagara River Toxics Management Plan and compatible with IJC activities. The Lake Ontario document will be completed by January 1, 1988.

Executed this 4th day of February, 1987

For the United States
Environmental Protection Agency

Mr. Lee Thomas
Administrator

For Environment Canada

The Honourable Tom McMillan
Minister

For the New York State Department
of Environmental Conservation

Mr. Henry G. Williams
Commissioner

For the Ontario Ministry of the
Environment

The Honourable Jim Bradley
Minister

SUMMARY OF SESSIONS

INTERNATIONAL SYMPOSIUM ON TOXICS IN THE NIAGARA

Toronto, Ontario
Canada

February 3-6, 1987

MONITORING AND ASSESSMENT OF NIAGARA RIVER TOXICS

Co-Moderators:

Tony Wagner
Environment Canada

Dr. Robert L. Collin
New York State Department of Environmental Conservation

Presenters:

Don Williams
Environment Canada

Serge Metikosh
Environment Canada

Peter B. Kauss
Ontario Ministry of Environment

John McMahon
New York State Department of Environmental Conservation

Michael Jovanovic
Ontario Ministy of Environment

Peter Buechi
New York State Department of Environmental Conservation

Jaak Viirland
Ontario Ministry of the Environment

Session Summary:

Dr. Robert L. Collin
New York State Department of Environmental Conservation

Mr. Tony Wagner introduced this session by giving a brief outline of the activities leading up to the present monitoring programs in both the ambient, as well as the point and non-point source areas. He referred to the November 1984 Niagara River Toxics Committee report, noting the complexities associated with monitoring which it outlined. He indicated, that rather than having a panel discussion at the end of the session, more time would be made available for questions from the floor.

Mr. Don Williams and Mr. Serge Metikosh, both of Environment Canada, gave a presentation describing environmental monitoring on the Niagara River.

Mr. Williams gave an historical introduction to the monitoring programs on the Niagara River. He looked at present activities in the context of the recommendations made by the Niagara River Toxics Committee Report in 1984. He also demonstrated the consistency of these activities with both the recommendations in the Niagara River Toxics Committee Report and the Great Lakes Surveillance Plan, developed by the International Joint Commission.

Mr. Serge Metikosh gave an outline of Environment Canada's present river monitoring activities which entail the use of a two-station ambient monitoring program. By using data from the upstream (Fort Erie) station, as well as the downstream (Niagara-on-the-Lake) station, the input of toxics along the Niagara River itself can be calculated. This two-year-old, state-of-the-art system, provides weekly monitoring of a wide variety of organics and metals.

The goals of this river monitoring program are to calculate loadings, based on concentrations and flows, and to determine trends by following the input of toxics over a long period.

There is also an international aspect to this program: the U.S. Environmental Protection Agency and the New York State Department of Environmental Conservation, as well as Environment Canada and the Ontario Ministry of the Environment are together responsible for setting the protocols for sampling, analysis, and data interpretation. The moderator noted that scientists and technical people need guidance from politicians concerning the level of confidence that they require. Dialogue between these two parties is therefore an integral part of the monitoring program.

Biomonitoring programs were discussed by Mr. Peter Kauss of the Ontario Ministry of the Environment. The data presented came from studies of spottail shiners (a species of small fish whose restricted movement provides a measure of local contaminants), as well as from caged clam monitoring, and cladophora monitoring programs carried out by the Ontario Ministry of the Environment.

The moderator noted the need to integrate this type of data from local monitoring into an overall management scheme for toxic chemicals.

There were two presentations on the topic of point source monitoring. Mr. John McMahon of the New York State Department of Environmental Conservation discussed the New York State permit program and its monitoring requirements, as well as the point source compliance monitoring by the Department, using its own samples and chemical analyses. For the past two years monitoring activities by New York State have been mostly limited to the collection of one sample per year at 21 major facilities. This has entailed 24-hour continuous sampling at 100 discharge pipes. A sampling frequency of once a year is recognized as not being sufficient to give accurate figures for loadings. He concluded that the most practical (i.e. frequent and precise) method of calculating loadings from point sources is to have the dischargers monitor their own outputs for those chemicals in their permits. This would be combined with the strict laboratory certification program which is now in operation.

Point source data from eight different facilities in Ontario – gathered over the last three years – were presented by Mike Jovanovic of the Ontario Ministry of the Environment. The presentation gave a status report of industrial and municipal point source discharges into the Niagara River Basin. It updated the 1981/82 data on priority pollutant loadings, in Ontario discharges, provided by the Niagara River Toxics Committee Report of 1984. These data showed significant declines in the discharge of toxic chemicals at these sites.

With regard to the presentation of these data, the moderator noted that the present practice of presenting loadings as a single figure which groups together a wide variety of chemicals is not scientifically meaningful. However, as yet no better alternative has been presented.

The session on Monitoring and Assessment of Niagara River Toxics concluded with two presentations on non-point source monitoring. The moderator expressed his satisfaction that scientists now seemed to have sufficient confidence in groundwater monitoring that they could begin to talk about loadings from hazardous waste sites to the Niagara River in quantitative terms.

Mr. Peter Buechi of the New York State Department of Environmental Conservation documented specific examples of attempts to calculate loadings from hazardous waste sites to the Niagara River.

Mr. Jaak Viirland of the Ontario Ministry of the Environment presented Ontario's work in non-point source monitoring, as well as an overview of the geology and the hydrogeology of the Niagara River Area. The presentation gave an updated, status report for 5 sites within the Niagara River Drainage Basin, which had been identified as needing further evaluation or remedial action by the Niagara River Toxics Committee Report in 1984. Mr. Viirland also noted the wide variety of contributing sites which fall into the non-point source category.

In the question period which followed this session there was considerable discussion of biomonitoring, as well as how the precision and accuracy of data affect their interpretation and use. A second major point was raised concerning the input of contaminants from Lake Erie into the Niagara River. For some metals the loadings carried in from Lake Erie are larger than the input along the river itself.

In his final comments the moderator noted that since the 1984 report of the Niagara River Toxics Committee there has been a great deal of progress in the reduction of toxic chemical loadings on both sides of the Niagara River. He noted that this improvement has come about without any formal agreement; it is the result of efforts by individuals, state and federal agencies, and municipalities.

This monitoring process will continue, and in time it may become incorporated into an overall environmental management plan for the Niagara River.

REMEDIATION TECHNOLOGY - EXCAVATION/EXTRACTION/CONTAINMENT

Co-Moderators:

Dr. John Cherry
University of Waterloo

Ronald Hill
U.S. Environmental Protection Agency

Presenters:

Dr. Wilhelm Rulkens
Netherlands Organization for Applied (Scientific Research)

James S. Walker
O.H. Materials

Donald R. McMahon
Goldberg-Zoino and Associates

Geoff Westerby
Gartner Lee Associates Ltd.

James Nash
Mason and Hanger

Session Summary:

Ronald Hill
U.S. Environmental Protection Agency

This session on Remediation Technology was moderated by Dr. John Cherry of the University of Waterloo, and Ronald Hill of the U.S. Environmental Protection Agency. A summary of the presentations in this session was given by Mr. Ronald Hill.

In his introductory remarks Dr. Cherry highlighted the complexity of the problems faced by remediation technologies. Focusing on the Hyde Park site, he noted that while most of the existing technology deals with contaminated overburden, the problems posed by the complex geology and highly fractured bedrock of this site remain largely unsolved.

The first presentation, by Dr. Wilhelm Rulkens from the Netherlands, gave an overview of both the extensive European experience with remediation, as well as the particular focus in the Netherlands on the treatment of contaminated soils and sediments. Dr. Rulkens looked at both potential problems and available technologies. He also noted the importance of establishing goals for remediation which define what is meant by a "clean" soil.

The Netherlands has defined three levels of "clean", based on the nature of the contaminant, the local situation, and the proposed use of the soil after cleanup.

At the site itself one can be faced with three different problems: the contaminants in solution, a large volume of soil mixed with a low volume of contaminants, and a soil mixed with a high volume of contaminants.

Dr. Rulkens then reviewed the experience of the Netherlands with various remediation technologies. He gave examples of thermal equipment and procedures, estimating the typical cost of treatment for soils at about $100 U.S. per ton.

In discussing the extraction of pollutants from soils he noted that it is essentially a separation process in which the highly contaminated fines (silt and clay) are removed, leaving behind the coarser fraction (sand and gravel) with its low level of contaminants. In the examples of successful soil washing using cadmium, zinc, and other compounds, the work again entailed the removal of fines, at an estimated cost of $75 U.S. per ton.

The discussion of microbial methods pointed out that the key to success is feeding the microbes oxygen and nutrients, controlling the water level and temperature, and selecting the proper organism for the job. However, high concentrations of any one contaminant, or the presence of toxic compounds may destroy the microbical population. The advantages and disadvantages of three microbial systems (land farming, composting, and wet and dry bio-reactors) were discussed. Other systems mentioned in this overview included steam stripping, air stripping, chemical treatment (particulary where it is used with cyanides), and technologies that are in the experimental or development stages.

Dr. Rulkens noted that some of these processes can be applied to in-situ treatment, as well as in the on-site modes discussed.

Mr. James Walker discussed extraction technologies and materials handling; this is a major concern for all remediation technologies which involve handling the material and/or transporting it to a treatment facility. This facet of treatment can entail both major problems and major labour costs.

The presentation focused on safety, which is both a significant problem, and a primary concern, for those who must handle hazardous materials. Problems associated with excavation include dust, watering (the presence of water both as a nuisance, and as a pollutant), the disposal of the excavated material, and the decontamination of the equipment used.

A major improvement in this area has been the development of special handling equipment to improve on-site safety and efficiency. Equipment developed for sites - such as those covered by the Superfund - include a drum handling machine which will cut up large tanks without using welding equipment, and special machines for destroying buildings and other structures. Mr. Walker concluded his presentation by reviewing case studies which entailed the staging and sampling of drums, digging cutoff trenches, repacking material, and capping experiments. He also reviewed the results of a land treatment study.

Mr. Donald McMahon gave a presentation on containment; the use of passive physical barriers to prevent the migration of hazardous materials. He focused mainly on the slurry trench cutoff wall, examining the factors involved in design, the importance of Quality Assurance/Quality Control (QA/QC), and the difficulty in ensuring that the slurry wall does not have a window or a hole in it. Other types of containment covered in the presentation included the vibrating beam wall and the compacted clay trench.

Mr. Geoff Westerby gave a presentation on groundwater, and groundwater plume management techniques. He discussed the various chemicals encountered, both the soluble contaminants as well as the immiscible contaminant phases (i.e. the "sinkers" and "floaters"). Different types of problems are posed when one tries to monitor, pump, or otherwise handle the contaminants, and different types of situations can be created by each combination of a contaminant and the environment. Mr. Westerby concluded by illustrating several methods for groundwater plume management.

Mr. James Nash discussed the removal of contaminants from soil and sludge solids by physical and chemical processes. He noted that these procedures can be used to reduce the volume loading on treatment systems at cleanup operations. The presentation also gave past experiences of the U.S. Environmental Protection Agency (EPA), Releases Control Branch in soil/sludge extraction of compounds such as dioxin and benzene.

In the discussion of remediation technology which followed there were many questions about the complexity of groundwater monitoring and sampling, particularly in the fractured bedrock of the Hyde Park site. Discussion of specific remediation techniques touched on air emissions and a number of techniques not covered by the session itself.

It was suggested that a complete cleanup of the Niagara should be done now, regardless of the cost, since an incomplete job will only necessitate a second cleanup in a few years.

There was some discussion of using factors such as risk assessment, cost-benefit ratio, and site priority in deciding how much to clean up a site.

U.S. HAZARDOUS WASTE PROGRAMS

Moderator:

Norman H. Nosenchuck
New York State Department of Environmental Conservation

Presenters:

Walter Kovalick
U.S. Environmental Protection Agency

Norman H. Nosenchuck
New York State Department of Environmental Conservation

Gene A. Lucero
U.S. Environmental Protection Agency

Douglas R. Blazey
U.S. Environmental Protection Agency

Marcia Williams
U.S. Environmental Protection Agency

David Mafrici
New York State Department of Environmental Conservation

Paul Counterman
New York State Department of Environmental Conservation

Session Summary:

Paul Counterman
New York State Department of Environmental Conservation

Mr. Counterman prefaced his summary by noting the impressive breadth of the U.S. programs presented in this session. These included the cleanup programs at the state and federal level under Superfund, and under the Hazardous Waste Regulatory Programs.

The session began with a discussion by Mr. Walter Kovalick of the site investigation and remediation programs which the U.S. Environmental Protection Agency (EPA) conducts nationwide. He outlined the various steps of the remediation program: the site investigation phase, the remedial investigation/feasibility study phase, the record of decision, the remedial design, construction/implementation, long term operation and maintenance phase, and the public involvement process. Mr. Kovalick stated that the remediation program for each site is expected to take an average of six years.

The nationwide figures show that 6,500 to 7,000 site investigations have been conducted since the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund, began in 1980. Of these sites 950 are now on the National Priority List (NPL), and 470 are currently in the Remediation Investigation/Feasibility Study stage. Aside from these sites there are over 800 others where action has been taken to protect the public health. The EPA has issued 178 records of decision, each of which constitutes a final determination of the remedial measures which should be taken at a site. Mr. Kovalick discussed the role of enforcement actions in the process, noting that over 600 million dollars for remediation work has been paid or is committed to be paid by responsible parties. Over 37 million dollars has been collected from responsible parties for work undertaken with Superfund funding.

Mr. Kovalick discussed the implications of the Superfund Amendments and Reauthorization Act (SARA) of 1986. These include new requirements which have yet to be specified, increasing the fund by 4 to 5 times to 9 billion dollars, the addition of new authorities such as health related authorities, mandatory schedules, clean up standards, and the use of permanent remedies whenever possible. Mr. Counterman noted that a number of presentations had stated that the U.S. Congress is tilting the remedial action program towards permanent remedies, as opposed to containment. Mr. Kovalick concluded with a detailed description and discussion of the process by which a specific remedy is chosen.

Mr. Norman Nosenchuck discussed New York State's program for site remediation in the Niagara Area, as well as some of the differences between the federal and state programs. The latter consists of phase 1 and phase 2 investigations, the first being a screening investigation, the second a more detailed preliminary site investigation, costing from $40,000 to $50,000.

Mr. Nosenchuck also described the Niagara Frontier, an area which contains 61 sites within 3 miles of the south shore of the Niagara River and its tributaries. Four of these sites, Love Canal, Hyde Park, S-Area, and the Niagara Country Refuse Disposal Site are on the EPA's National Priority List for Superfund funding. Mr. Nosenchuck concluded with a discussion of the Environmental Bond Act which provides $1.2 billion for remedial action activities in New York State.

Mr. Gene Lucero of the U.S. Environmental Protection Agency (EPA) provided an overview of the hazardous waste enforcement program under both the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (amended 1986), and the Resource Conservation and Recovery Act (RCRA) of 1976 (amended 1984). He discussed joint, several, and strict liability, as well as the identification of the various parties that can be held responsible for cleaning up a site under the U.S. enforcement program.

The EPA expects that in the next few years private parties will commit between 3 and 4 billion dollars to remedial activities. Thus, the major portion of the cost of these activities in the U.S. will be paid for by the responsible parties (i.e. generators and transporters), and the owners of property used for waste disposal.

Mr. Lucero discussed the efforts by the EPA to promote settlements with responsible parties; in most cases these efforts have resulted in out of court settlements. This work has been greatly enhanced by the strong negotiating position given to the U.S. government by the CERCLA and RCRA legislation. The recent changes in the enforcement process under the Superfund Amendment Reauthorization Act (SARA) of 1986 were also mentioned. The new act can alter the negotiating process by allowing for mixed federal government and private party funding. It also allows the EPA to "cash out" de minimis responsible parties. Those with just a few drums at a large multi party site would therefore be able to come to a cash settlement without going through the negotiation, and/or litigation processes.

Mr. Doug Blazey is the head of enforcement for the U.S. EPA, Region II, which includes New York State. His presentation began by addressing the broad perspective of enforcement programs by the U.S. related to toxics substance discharges in the Niagara area. He discussed the programs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Superfund Amendments and Reauthorization Act (SARA), as well as those under the Clean Water Act (CWA), and the Toxic Substances Control Act (TSCA). He also described specific enforcement actions, under these acts, applied to the cleanup of specific problems on the Niagara River. For example, action taken under the Clean Water Act at the Niagara Falls Wastewater Treatment Plant was successful in getting the activated carbon beds back on line at a chemical/physical wastewater treatment plant which has had major design and operational problems. Mr. Blazey also discussed the enforcement actions against Du Pont at the Necco Park site as well as the CECOS consent order.

Ms. Marcia Williams provided an overview of the programs operating under the Resource Conservation and Recovery Act. She also reviewed the federal system for identifying and listing hazardous wastes, the requirements for generators and for manifesting waste, and the regulations governing treatment, storage, and disposal facilities. She also outlined the process of delegating, to the states, the authority to operate the federal Hazardous Waste Regulatory Program within their own boundaries.

Mr. David Mafrici, of the New York State Department of Environmental Conservation, discussed the state's regulatory program as it affects generators and transporters of hazardous waste. New York state has over 700 generators of hazardous waste, and produces in excess of 16 million tons of waste per year. Most of this is aqueous waste which is treated on-site, however, 500 thousand tons is non-aqueous, and much of this must be shipped off-site for treatment or disposal. He noted that, in 1985, 139,000 tons of hazardous waste were imported into New York State, and 140,000 tons were exported. Thus, a rough balance between the two was maintained for the state as a whole.

Mr. Mafrici described New York State's stringent manifest system which uses an 8-page form similar to that developed by the other northeastern states. However, New York State computerizes these forms each day, and keeps track of the movement of waste. If a shipment does not reach its destination, the state initiates its own search procedure.

New York state conducts over 800 inspections of generators, transporters and hazardous waste facilities each year. The state also has full time on-site monitors at the major hazardous waste facilities in Niagara County.

The final presentation of this session on U.S. hazardous waste programs was by Mr. Paul Counterman of the New York State Department of Environmental Conservation. Mr. Counterman gave an overview of the hazardous waste permit program in New York State. He distinguished between the state and federal permit programs noting that the former was, in his opinion, more stringent in a number of important areas.

Due to changes in the regulatory program, as well as costs and other factors, the number of hazardous waste facilities in New York State which are subject to permitting programs has dropped from over 500 in 1980 to 221 at present. This indicates that there have been major changes in how companies manage their waste, as well as in the type of wastes they are managing.

In Erie and Niagara counties, only 30 hazardous waste facilities now require permits; 10 are commercial facilities, and, of the 30, all but 5 either have permits or have permit applications under review. Similarly, of the 47 land disposal facilities operating in New York State in 1980 only 6 are pursuing operating permits, the other 41 have closed.

Mr. Counterman concluded that the existing state and federal programs for regulating hazardous waste, and for cleaning up hazardous waste problems, are both broad and comprehensive.

THERMAL TECHNOLOGY

Co-Moderators:

Tim Oppelt
U.S. Environmental Protection Agency

R.A. (Ben) Grant
ECODYNE Limited

Presenters:

Larry Doucet
Doucet & Mainka

Harry Freeman
U.S. Environmental Protection Agency

Dr. Thomas Barton
Pyrolysis Systems, Inc.

Edward Peduto
GCA Technology Corporation

Frank Freestone
U.S. Environmental Protection Agency

Session Summary:

Tim Oppelt
U.S. Environmental Protection Agency

Mr. Oppelt began his summary by noting that thermal technology, or "purification by fire", is a technology which has both ancient roots (as supported by biblical and medieval examples), and a promising future. In modern times, it has progressed from the "smokestack era", to the modern technologies presented at the Symposium.

The session began with Mr. Larry Doucet's presentation on Emerging Thermal Destruction Technology. A variety of thermal technologies are available for which any waste with an organic content is a candidate. However, cost is also an important criteria in deciding which wastes can be treated. While destruction is the major purpose for ulilizing thermal technologies, volume reduction and energy recovery can also be criteria for using this type of facility.

Mr. Doucet reported that, in general, tests have shown that incinerators do meet the U.S. Environmental Protection Agency's standards for destruction of contaminants andremoval of hydrochloric acid, however, there have been some problems with removal efficiencies in controlling particulate emissions.

Mr. Harry Freeman highlighted 8 of the important emerging thermal destruction technologies. He began with wet-air oxidation and supercritical wet oxidation, two technologies designed to deal with the aqueous waste which makes up 80% of the hazardous waste generated in the United States. Wet oxidation has been demonstrated but a polishing step is generally required afterwards. Supercritical wet oxidation is a higher temperature, higher pressure approach, one which has not been demonstrated in the field, but promises a high destruction efficiency capability. The moderator noted that the presentation of these technologies generated discussion concerning deep shaft technology, a process similar to wet oxidation, but using a different type of reactor design, as well as discussion of the older molten glass, and molten salt incineration technologies.

Pyrolytic techniques were also presented. These included the Huber High Temperature Electric Reactor, the Shirco Infra Red Incinerator, and a pyrolysis process which has been demonstrated and used at a U.S. Army installation. The principal advantages of these 3 techniques are that they require less combustion area, thus allowing for greater throughput with the same area as a conventional combuster, and that they are particularly suited for high ash materials.

Emerging technologies do not offer a panacea, but rather a variety of tools, each suited to a specific form of waste, be it aqueous, high ash, or highly hazardous. Discussion of costing estimates concluded that in general only site specific estimates are truly reliable.

The plasma torch process, which has as yet been used only on liquids, was described by Dr. Thomas Barton and Edward Peduto. High destruction efficiency has been demonstrated by this process for PCB and carbon tetrachloride. A demonstration facility located at Love Canal is, at present, awaiting both permits and funding from the U.S. Environmental Protection Agency in order to begin operation.

In the final presentation of this session Mr. Frank Freestone described the U.S. Environmental Protection Agency's mobile incinertor. This is essentially a large one ton per hour conventional rotary kiln on wheels. In tests, with dioxin contaminated soils and liquids at the Denney Farm site in Missouri, the incinerator has achieved a destruction and removal efficiency of 99.9999%. Mr. Freestone stressed the importance of design simplicity to enhance the reliability of such mobile equipment.

During the question and answer period following this session the topics discussed included fugitive emissions, the reliability of the U.S. EPA rotary kiln, and whether any kind of emission to the atmosphere should be allowed from incineration. There were also questions about the availability of records from incineration operations in the U.S. and Canada. Metal emissions, which are a problem at some incinerators, were also discussed. This last problem was seen as one whose solution rests in the better use of existing air pollution control technology.

CANADIAN HAZARDOUS WASTE PROGRAMS AND OVERALL PERSPECTIVE

Moderator:

Ron Gotts
Ontario Ministry of the Environment

Presenters:

Peter Higgins
Environment Canada

Ron Gotts
Ontario Ministry of the Environment

Dr. Barry Mitchell
Ontario Waste Management Corporation

Dr. Harvey Yakowitz
Organization for Economic Cooperation and Development

Session Summary:

Ron Gotts
Ontario Ministry of the Environment

Mr. Peter Higgins of Environment Canada began the session with a description of Canada's proposed Environmental Protection Act, which was first released as a draft bill in December 1986. This timely presentation described the proposed act, and its provisions. The Preamble to the Act acknowledges the right of Canadians to a healthy environment and commits the federal government to cooperation with provincial and territorial governments, in consultation with all Canadians, to protect and enhance the environment.

The Act provides a comprehensive framework to assist governments to control toxic chemicals throughout their life cycle - namely from their development, through their manufacture, transport, distribution, use, storage, right up to their ultimate disposal as waste.

The Act requires anyone introducing a chemical into Canada to notify the Minister and to supply specific information before, not after, the chemical is imported or manufactured. The wording in the Act would be such that the Minister need only have "reason to suspect" in order to compel manufacturers and importers to provide sufficient data to assess the potential hazards, and if necessary, control the chemical. Likewise, the Minister of the Environment will have the power to recall chemicals or products that contain chemicals that have been manufactured, imported, processed or distributed in contravention of the Act or its regulations.

The proposed Act provides for improved powers for inspectors and sets a maximum fine of $1,000,000 and five years as the maximum term of imprisonment.

The toxic substances provisions of the legislation will apply equally to both federal departments, agencies, and Crown corporations as well as to the private sector.

The proposed Environmental Protection Act will consolidate the environmental protection provisions of the Environmental Contaminants Act, Clean Air Act and Part III of the Canada Water Act, as well as Section 6(2) of the Department of Environment Act, which allows the Minister of Environment to establish environmental protection guidelines for federal departments and agencies to use in exercising their mandate.

Mr. Higgins also described activities associated with the bill, or to be carried out under the umbrella of the Canadian Council of Resource and Environment Ministers (CCREM). This includes the development of national codes for landfills at Hazardous Waste Destruction Facilities, which would be both compatible with, and complementary to, provincial legislative requirements. A key factor in the enforcement of the proposed act will be agreements in this area between the federal government and the individual provinces.

Mr. Ron Gotts spoke about hazardous waste control programs in Ontario. He began with a review of the 1983 "Blueprint for Waste Management in Ontario". This document, created through a public consultation process, set out the approach to be taken to the establishment of new requirements for Waste Management in Ontario. He reviewed proposed amendments, identified key differences between the Ontario regulations and those in place under the U.S. Resource Conservation and Recovery Act (RCRA), and discussed the impact of these new regulations on stakeholders, primarily the generators, transporters and those who dispose of the waste.

Mr. Gotts concluded that the information programs for those subject to the new regulation 309 have been reasonably effective, given that approximately 10,000 Generator Registration Reports have been submitted to the Ontario Ministry of the Environment. The new initiatives in the four R's – reduction, re-use, recycle, and recovery – for industrial waste will include work with the Ontario Waste Management Corporation (OWMC) to jointly fund an Ontario Waste Exchange, one which will play a more active role than the present Canadian Waste Exchange.

The Ontario Household Hazardous Waste Program carried out 9 programs in 1986 and collected 30 tonnes of household hazardous waste; 30 such programs are scheduled for 1987. The goal is both waste collection and increased public awareness of the hazardous waste problem.

The Ontario Waste Management Corporation (OWMC) is a body charged with the responsibility for siting, designing, building, and operating a hazardous waste treatment facility in Ontario. Dr. Barry Mitchell gave a brief overview of the Corporation's activities in the last few years, and where it stands at present.

The OWMC has been in business since 1981, and has spent 34 million dollars in planning activities. It has recently chosen the proposed site for a hazardous waste treatment facility which will consist of a rotary kiln incinerator, a physical/chemical treatment

plant, a solidification plant and a secure landfill. The site chosen was one of 8 candidate sites identified after a lengthy study of the entire province on a region, area, and finally a candidate site basis.

The Ontario Waste Management Corporation has also just released a draft of the Environmental Assessment required by Ontario legislation; it consists of 22 volumes and 7,000 pages. The corporation will also be participating in public hearings as part of the assessment process.

The Ontario Waste Management Corporation will use proven technology in its facilities, while at the same time monitoring emerging technologies. Their facility will handle wastes which have no outlet at present, and will therefore work in parallel with members of the private sector without competing with or displacing them.

Dr. Harvey Yakowitz reviewed the activities and concerns, related to hazardous waste management, of the Organization for Economic Cooperation and Development (OECD), and its 24 member countries, which include Canada, the United States, Japan, New Zealand, Australia, and Western Europe. The broad goals of the OECD are to achieve environmental quality and economic growth for the member states. The priority issues for hazardous waste are waste minimization, transfrontier movements, liability and insurance.

In his presentation Dr. Yakowitz first reviewed the situation in Western Europe where an estimated 20 to 24 million metric tons of hazardous waste are produced annually, and transboundary movements occur at the rate of one load every 5 minutes. The movement of waste also exhibits a tendency towards Eastern Europe where waste seems to be easier to dispose of.

The different approaches to hazardous waste liability among member countries were noted. For example, generators have virtually no responsibility or accountability in Finland or Japan, and victim compensation (a major concern in North America) has not been provided for by any member country.

In a brief overview of hazardous waste management throughout the OECD, Dr. Yakowitz touched on topics such as the use of waste codes and identification in Austria and Germany, waste entombment in Holland, the export of virtually all of Ireland's hazardous waste for management in the United Kingdom, the beginnings of hazardous waste management in Portugal, and the inventory of 32,741 uncontrolled hazardous waste sites in Germany. He also noted that Japan's program relies not on paperwork, but rather on thousands of inspectors who travel throughout the country visiting each hazardous waste facility individually.

In the discussion at the end of this session there were questions concerning the role of the Ontario Waste Management Corporation, as well as a discussion of the possible economic benefits of pollution control.

Mr. Gotts concluded that this session had succeeded in demonstrating the movement, in Canada, towards more dialogue amongst the many jurisdictions; this will in turn lead to greater cooperation.

HAZARDOUS WASTE TREATMENT

Co-Moderators:

Dr. Bruce Jank
Environment Canada

Robert Olexsey
U.S. Environmental Protection Agency

Presenters:

Joan Boegel
Metcalf and Eddy

Jurgen Exner
IT EnviroScience

Pierre Côté
Environment Canada

Michael Amdurer
EBASCO Services

Rick Traver
U.S. Environmental Protection Agency

Session Summary:

Dr. Bruce Jank
Environment Canada

In his introductory remarks, Robert Olexsey noted the omission from this session of treatment by source minimization. He emphasised the importance of source control and source minimization which represent the most cost effective means of handling these materials. Projections have shown that with source controls a 1/3 volume reduction is possible. This will become an important economic factor when industrial contributors begin paying substantial costs for waste disposal by the load. They will then reassess the situation and determine what steps can be taken to reduce hazardous waste generation at source. In his summary, Dr. Jank noted the applicability of these processes, not only to waste treatment, but also to source minimization.

The first presentation in this session, by Ms. Joan Boegel, looked at the established physical, chemical, and biological technologies. The processes reviewed included industrial wastewater treatment, physical separation processes (such as steamstripping), and chemical processes (essentially chemical oxidation and precipitation).

Ms. Boegel also discussed biological technologies; the potential for using biological treatment facilities at source. It was noted that – while 5 to 10 years ago biological treatment, design, and operation only considered biological oxidation of the pollutants – it has now been realized that stripping of volatile compounds from the various processes is extremely important, and that the system must be designed to take this factor into consideration. There is also the potential for significant chemical oxidation in the biological system. If the compounds are recalcitrant, the possibility exists that there will be a significant accumulation of chemical compounds within the biomass. Therefore, although the hazardous material has been removed from the liquid phase there may be a residue which retains toxic compounds in relatively high concentrations.

The key to successful use of established technologies is to look at the process involved, the design, and also to perform the appropriate waste characterization/treatability analysis in order to assess the suitability of the proposed technology. The full scale treatment system must be properly operated by fully trained personnel. If these guidelines are followed there is no question that established, conventional technologies can play a major role in the treatment of hazardous wastes.

Dr. Jurgen Exner began his presentation on emerging technologies in hazardous waste treatment by stating that the technologies that we are going to use in the future already exist. The moderator noted that - while this is true to some extent - the complexity of the problems being faced require additional work to ensure that the designs are appropriate and that the systems are operated properly. Dr. Exner highlighted a number of emerging technologies, particularly those designed to recover volatile compounds from soils. These include a radio frequency thermal treatment process which is being demonstrated at present, a thermal stripping process involving thermal desorbtion and U.V. pyrolysis, and a process for dehalogenation using polyglycols.

This presentation also focused on the fact that, while technologies already exist, actual use is being limited by unrealistic societal demands. This is possibly because a general understanding of the potential of these technologies is lacking. Tied to this societal phenomenon is the complexity of permitting operations. The costs and time spent in environmental hearings, while an important component in the process of finding solutions, do not help to demonstrate appropriate technical solutions.

Technical specialists are aware of the problems and are working to put together the facilities needed to solve them. The solution will include the appropriate controls over the operation and monitoring of these facilities.

It is important that we not tie our hands and prevent the advance of the technologies which will provide the appropriate solutions to the urgent problems posed by hazardous wastes.

The treatment of hazardous waste using conventional technologies, or modifications of conventional technologies, will often result in a residue. The presentation by Mr. Pierre Côté dealt with the final treatment process for these residues. Mr. Côté's work has identified that the fixation/stabilization and solidification technologies are best adapted to use with inorganic residues; their applicability for organic residues has yet to be proven.

The presentation described a set of procedures established for the evaluation of the solidification processes, as well as monitoring procedures for quality control by the various vendors who are solidifying waste streams. The presentation outlined the procedures in evaluation, beginning with the generation of samples, curing the solidified samples, and finally sending the samples to a centralized agency which will provide the quality control on the operation of the solidification facility.

An important component of this program is a major study which is at present analyzing the solidification operations of 15 major vendors. It is looking at 5 different types of waste streams in order to assess the overall acceptability of many of the solidification processes now being sold.

In the second part of this session the topic changed from centralized hazardous waste treatment operations, in which the waste is transported for treatment, to in situ operations, which attempt to treat the waste at the existing site.

Mr. Michael Amdurer reviewed in situ treatment using chemical and biological processes. The technologies involved are based on the enhancement of natural processes which are known to be taking place in the site. He began by identifying the types of natural processes which occur in existing hazardous landfill sites, and have a significant impact on the hazardous materials. These include volatilization of compounds, flushing or soil washing (depending on water availability), chemical precipitation of compounds, oxidation-reduction reactions, and possibly biological degradation.

Mr. Amdurer also assessed specific technologies for in situ treatment. Volatilization can be increased using a process which creates a vaccum on a well, thus enhancing the extent of air stripping. The soil washing process can be enhanced by using water, water plus additives, or solvents to accelerate the removal of organic compounds or contaminants from the soil matrix. The potential of in situ solidification and vitrification processes was also discussed. The last major process for potential enhancement is oxidation. In situ oxidation is limited by the lack of control over the systems, however, research has been conducted on the enhancement of oxidation using hydrogen peroxide, hypochlorite, ozonation, hydrolysis, and biodegradation.

The moderator cautioned, however, that given the potential for generating chlorinated organics the use of hypochlorite to enhance oxidization should be questioned. Indeed Dr. Jank found the whole area of in situ treatment to be very problematic. He cautioned that one must look at the specific site, and all of the environmental conditions associated with that site, in order to determine the acceptability of this type of treatment process. From an engineering perspective, the process lacks the tight controls necessary to conduct a mass balance analysis which will determine if it is performing at an acceptable efficiency. The in situ system is, the moderator concluded, truly a black box approach. While in situ treatment does unquestionably have applications, its use must be very carefully monitored.

The final presentation by Mr. Rick Traver of the U.S. Environmental Protection Agency dealt with on-site chemical and biological treatment processes. It reviewed specific treatment programs which have been carried out, or are being carried out, in the United States.

The review included information on the thermal treatment of dioxins at the James Denney farm, examples of on-site regeneration of activated carbon, soil washing for the treatment of lead contaminated soils, and an in situ process for washing JP4 fuels from fire training facilities.

The moderator, Dr. Jank from Environment Canada, noted that from a Canadian perspective this was a very enlightening presentation; Canada has had little experience with specific cleanup operations. The type of field experience described in this session is necessary in order to acquire the techniques and experience needed to ensure that cleanups proceed in a technically sound, cost-effective manner.

CLOSING REMARKS

Christopher J. Daggett
U.S. Environmental Protection Agency
Regional Administrator for New York,
New Jersey, Puerto Rico and the Virgin Islands

First let me thank everyone for attending, particularly our Canadian hosts led by Elizabeth Dowdeswell from Environment Canada, and Walter Giles from the Ontario Ministry of the Environment. I would also like to thank the staff people particularly Ken Stoller who has spent a lot of time over the past few days keeping everybody on track and keeping it organized. It has been a good conference with a remarkable mix of government, industry, and the public -- there have been good solid accomplishments.

First: the signing of the Declaration of Intent which recognizes the vital importance of the Niagara River to both Canada and the United States. It recognizes the mutuality of our interest in protecting and preserving the Niagara River; it recognizes that we must work together not at odds if we are to succeed in protecting the river; it gives us the framework and the mandate to continue with our aggressive cleanup programs; it defines our ambitious but achievable goals that we can strive towards. Finally, and perhaps as important, we even had Margarita Howe - who has been one of our most frequent critics - say that it was a good day. So we were all very pleased at the end of it, and I hope you shared that pleasure with us. We had an opportunity to share first hand, not only what we already know, but also what we must still find out. We shared what programs and authorities were already applying to the task, and what we still must do to improve them; we had a solid exchange of technical know-how that provided us in government with real food for thought on how to control toxic chemicals, and more importantly how to clean them up. Perhaps most important we have had a chance to meet, and to get to know one another, to exchange our concerns, to hear differing opinions, and to appreciate each person's point of view --no small accomplishment.

For the future I certainly hope that we do not lose the momentum and enthusiasm that we have generated here this week. As government agencies I think we will all go home - look closely at the results - and we will try to decide how best to continue the dialogue we have developed here. I hope that as we go through that process you will all share your thoughts with us, and if you have any particular concerns that you have had as a result of this conference, that you will not hesitate to get in touch with any or all of us about them.

Finally, for our part the EPA pledges to maintain the strong commitment we have to the Niagara River and to fulfill our part in the bargain as spelled out in the Declaration of Intent and the Action Plan. We have spent an awful lot of time and resources over the years in this region, we continue to do so, and believe me we will have a future that keeps that commitment going.

Finally, as Ken Stoller pointed out - if you have not done so already - we want to make sure that we have your name and mailing address so that we can get the conference results to you, but most important I hope that you too have enjoyed the conference as much as we have and that you go back with not only some new information, but also with some new associations that you have established that can help us move toward all of our ultimate goal; and that is cleaning up, and continuing to keep clean, the Niagara River. Thank you again for attending; I hope you all have a safe and pleasant trip home. Thank you.